

present in the vacuum chamber 10 are exhausted via the exhaust hole 24 and the fourth pipe 26 using the switching value 28 and the vacuum pump 30. Then, cooling water and gases are supplied to the cooling line 16a in the susceptor 12 via the first pipe 16 from the cooling water/gas supply device 18, to control the temperature of the susceptor 12, i.e., the temperature of the silicon wafer 14 on the susceptor 12. The hydrogen gas and the fluorine-containing gas in a plasma state are supplied into the vacuum chamber 10 (i.e., downflowing process) for a chemical reaction with the oxide layer formed on the silicon wafer 14. When the chemical reaction no longer proceeds due to generation of a reaction layer (not shown), the susceptor 12 is moved to the upper portion of the vacuum chamber by the operation of the vertically movable shaft 20 and the motor 22. Then, the heater 54 installed at the upper portion of the vacuum chamber 10 is operated to anneal the silicon wafer 14 mounted on the susceptor 12, thereby vaporizing the byproduct of the reaction between the oxide layer and the reaction gases, i.e., the reaction layer. The vaporized byproduct is exhausted through the exhaust hole 24 and the fourth pipe 26. Then, the susceptor 12 which has been moved up from its initial position for the annealing process is moved back to the lower portion of the vacuum chamber 10 using the vertically movable shaft 20 and the motor 22. --

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IN THE CLAIMS:

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Please cancel claims 1-6 and 12-37 without prejudice to subsequent prosecution or disclaimer of the underlying subject matter.

Please add new claims 38-43.

-- 38. A semiconductor manufacturing apparatus, comprising:
a vertically movable susceptor installed at a lower portion of a processing
chamber and adapted to support a wafer thereon;
a heater disposed within an upper portion of the processing chamber above the
susceptor and adapted to heat the wafer; and
a gas diffuser installed within the processing chamber and adapted to supply
reaction gases into the process chamber.

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39. The apparatus of claim 38, wherein the gas diffuser is connected to two
separate pipes extending outside of processing chamber, one of the two pipes being
adapted to supply to the gas diffuser a first gas excited to a plasma state and another
of the two pipes being adapted to supply to the gas diffuser a second gas that is in a
non-plasma state.

40. The apparatus of claim 39, further comprising a plasma generating device
for exciting the first gas into the plasma state.

41. The apparatus of claim 38, wherein the heater is one of a lamp and a laser.

42. The apparatus of claim 38 where the heater is adapted to anneal the wafer.